11. Stock

Program Name: Stock.java Input File: stock.dat

The stock market is a complicated place. In theory, the algorithm to make money is easy: sell high and buy low. However, given that you do not know the future, buying and selling at the correct time is much more difficult. Fortunately, you found a magical oracle that tells you exactly what the stock prices of a given company will be for the next N days at closing time. Given this, determining when to buy and sell optimally (at the local minimum/maximum) is easy. Write a program that, given an N day schedule, determines when to buy and sell the stock. Assume that you only buy and sell on these fixed stock prices, we ignore the fluctuations during the day.

Additionally, for the sake of determining a local minimum/maximum, assume the stock price is never the same on consecutive days. Also, assume you already have some stock in each of these companies, so you don't have to buy before you can sell the first time.

Input
The first line will be a single integer T, the number of companies your oracle has fetched stock schedules for.
The first line of each company will contain a single integer N, the number of days of the schedule, followed by a string that is the name of the company. The name will have no spaces and consist of only capital letters.
The next line of each will contain N space-separated integers, the stock price on the ith day, for $1 \leq i \leq N$.

Output
For each company, print the company name on a single line. Then for each action, either buy or sell, print the day number it is performed, followed by the action. These should be printed in day order.

Example Input File
```
2
4 TEST
1 3 2 4
5 ABC
5 3 1 4 8
```

Example Output to Screen
```
TEST
1 BUY
2 SELL
3 BUY
4 SELL
ABC
1 SELL
3 BUY
5 SELL
```

Explanation of first test case:
At day 1, the value of the stock on day 1 (1) is less than the value of the stock on day 2, and since there is no previous day to compare it to, it is a local minimum, so we want to buy.
At day 2, the value of the stock on day 2 (3) is greater than the value of the stock on day 1 (1) and day 3 (2), so it is a local maximum, so we want to sell.
At day 3, the value of the stock on day 3 (2) is less than the value of the stock on day 2 (3) and day 4 (4), so it is a local minimum, so we want to buy.
At day 4, the value of the stock on day 4 (4) is greater than the value of the stock on day 3 (2), and there is no day 5 to compare against, so it is a local maximum, so we want to sell.